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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/801,354	03/07/2001	Hiroyuki Sekine	NEC 62284	4883

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EXAMINER
HON, SOW FUN

ART UNIT	PAPER NUMBER
1772	5

DATE MAILED: 05/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-5

Office Action Summary	Application No. 09/801,354	Applicant(s) SEKINE ET AL.	
	Examiner Sow-Fun Hon	Art Unit 1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) *8-18* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 7* is/are rejected.

7)☒ Claim(s) *5 and 6* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2,4* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-7, drawn to an article, classified in class 428, subclass 1.5.

II. Claims 8-18, drawn to a method, classified in class 427, subclass 160.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the acrylic film can be made by photopolymerization with a photo-latent catalyst instead of thermal polymerization with a heat-latent catalyst.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Norman Soloway on April 22, 2003 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-7. Affirmation of this election must be made by applicant in replying to this Office action. Claims 8-18 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the

currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear:

a. How the different films and layers are arranged on the substrate;

b. What the inter-layer film structure is. Is it a film which is deposited on the prior etched film structure and then etched?

c. Whether the opposite substrate is the one and same second transparent substrate;

d. Whether the common electrode on the opposite substrate is the one and same second transparent electrode, in which case it should be stated as such.

Claim Rejections - 35 USC § 103

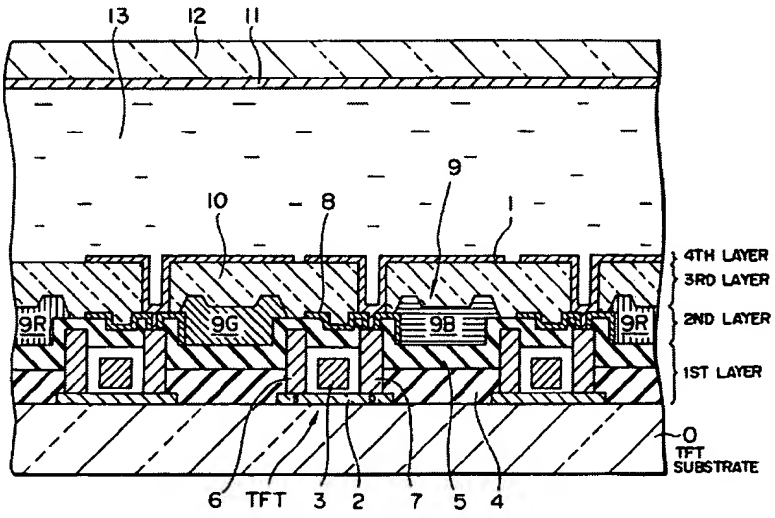
8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1-2, 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al. (US 5,818,550) in view of Sakamoto et al. (US 6,069,678).

Kadota et al. has a liquid crystal display unit comprising: a TFT substrate with a thin film transistor formed thereon; an opposite substrate with a common electrode formed thereon; and a liquid crystal layer 13 packed and formed between these substrates, wherein said TFT substrate comprises a first transparent substrate 0, a TFT 2, a first interlayer film 4, a wiring metal film (wired electrode 6, 7), a second interlayer film 5, a third interlayer film (color filter 9), a smoothening film (planarization film 10), a first transparent electrode film (pixel electrode 1) sequentially formed on the first substrate, said opposite substrate comprises a second transparent substrate 12, and a second transparent electrode (counter electrode 11) sequentially formed on the second substrate. The sequence is determined by the height of the bottom of the layer from the substrate.



Because Kadota et al. teaches that the smoothening film (planarization) is made of an acrylic resin which is suitably transparent (column 5, lines 50-70), it is the examiner's position that the transparent resin passes light through without absorbing light with a wavelength of 300 nm or higher.

Kadota et al. fails to teach an alignment layer on both sides of and in contact with the liquid crystal layer. However, alignment layers sandwiching and in contact with the liquid crystal layer in order to align the liquid crystal molecules in a liquid crystal display are well-known in the art.

Kadota et al. teaches a light shielding film (black mask 8) between the second interlayer film 5 and the third interlayer film (color filter 9), but fails to teach a light shielding film and an underlying film below the TFT in order to shield light from entering the amorphous silicon thin film 2 (column 7, lines 1-25).

Sakamoto et al. demonstrates that it is well known in the art for a liquid crystal device to have alignment layers (orientation films) sandwiching and in contact with the liquid crystal layer 2201, and a light shielding film formed right on the TFT substrate with an underlying film (first interlayer) directly underneath the TFT (starting with the source and drain electrode film). The light shielding film shields light which otherwise enters the amorphous silicon layer (a-Si layer 1101, 11101) (columns 3-4, lines 10-35). See embodiments on the next page.

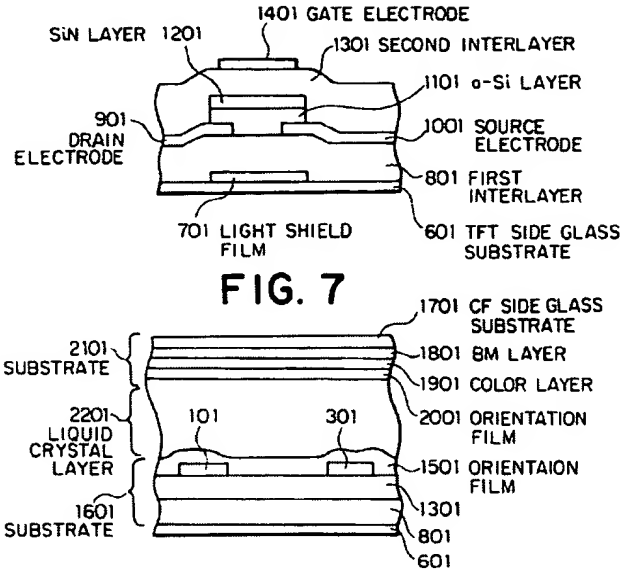


FIG. 7

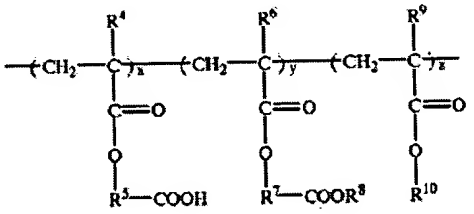
Because Sakamoto et al. teaches that the light shielding film shields light which otherwise enters the amorphous silicon layer, it would have been obvious to one of ordinary skill in the art to have positioned another light shielding film with the accompanying underlying film under the TFT in the invention of Kadota et al. in order to shield the TFT from external light for better control of the light display.

10. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al. in view of Sakamoto et al. as applied to claims 1-2, 7 above, and further in view of Maeda et al. (US 6,248,499).

Kadota et al. has been discussed above, and teaches the liquid crystal display, TFT substrate and acrylic resin smoothening film. Kadota et al., however, fails to teach the claimed formula of the acrylic resin.

Maeda et al. teaches an acrylic resin (acrylate polymer) which allows the formation of high resolution submicrometer patterns by eximer laser beam etching in the fabrication of semiconductor devices. Since Maeda et al. teaches that the resin has high substrate adhesion (column 4, lines 10-25) it can be inferred that the resin behaves as an adhesive which enables it to fill submicron cavities and smoothen submicron roughness. The acrylic resin has the formula below:

(2)



[0021] wherein R^4, R^6 and R^9 each represents a hydrogen atom or a methyl group, R^5 and R^7 each represents a C_{17-23} divalent hydrocarbon group containing a bridged cyclic hydrocarbon group, R^8 represents an acid-decomposable group, R^{10} represents a hydrogen atom or a C_{1-12} hydrocarbon group, x+y+z equals to 1, and x, y and z stand for 0 to 1, 0 to 1, and 0 to 0.9, respectively, and having a weight average molecular weight of from 1,000 to 500,000.

Since Maeda et al. teaches that the acrylic resin composition allows the formation of high resolution submicrometer patterns by eximer laser beam etching in the fabrication of semiconductor devices, and the smoothening film underlying the pixel electrodes of Kadota et al. doubles as a photoresist, the pixel electrodes of Kadota et al. would have submicron patterning precision, and since the adhesive nature of the resin which smoothens submicron cavities for the planarized deposition of the pixel electrode film would further contribute to the precision of the submicron patterning, it would have been obvious to one of ordinary skill in the art to have used the specific composition of Maeda et al. as the acrylic resin photoresist/smoothening layer on the TFT side of the liquid

crystal cell of Kadota et al. in order to obtain a liquid crystal display with electrodes which have the desired submicron patterning precision.

Allowable Subject Matter

11. Claims 5-6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number is (703)308-3265. The examiner can normally be reached Monday to Friday from 9:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (703)308-4251. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

SH
Sow-Fun Hon
05/07/03

HAROLD PYON
SUPERVISORY PATENT EXAMINER
1772
5/5/03